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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,923	06/06/2000	Iwao Okamoto	0941.64338	9435

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EXAMINER	
RICKMAN, HOLLY C	

ART UNIT	PAPER NUMBER
1773	27

DATE MAILED: 12/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

eb 27

Office Action Summary	Application No.	Applicant(s)	
	09/588,923	OKAMOTO ET AL.	
	Examiner	Art Unit	
	Holly Rickman	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,10,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-10,12 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *22,26* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/11/03 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 10, and 12-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 10, and 12-13 are rendered indefinite by the use of improper Markush terminology. Specifically, each of the claims identifies a variable M3, M2, or M4 wherein the variable is any number of elements of "alloys thereof." "[A]lloys thereof" is actually a group which encompasses many different alloys. Thus, each element of the Markush group is not referenced in the alternative (A, B, C or D). It is suggested that Applicant amend the claims as follows: "where M3 = an element or alloy thereof selected from the group consisting of Co, Cr, Fe, Ni or Mn."

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4, 6, 10, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carey et al. (US 6280813) in view of Wu et al. (US 6221481).

Carey et al. disclose a magnetic recording medium having a ferromagnetic CoPtCrB layer, a magnetic Co layer, a non-magnetic Ru spacer layer having a thickness of 0.6 nm, a second magnetic Co layer, and a top magnetic CoPtCrB layer disposed thereon (Fig. 3, col. 5, lines 26-51). The reference teaches that the "ferromagnetic layer" (no. 14 in Fig. 1) and the "magnetic layer" (no. 12 in Fig. 1) have magnetization directions that are antiparallel (see figures 1, 2a, and 4). The reference also teaches that the spacer layer is formed from Ru, Cr, Rh, Ir, Cu, and alloys thereof (col. 7, lines 52-55). As such, the reference suggests adding any one of the elements to a Ru spacer layer. The reference is silent with respect to the degree of lattice mismatch between the non-magnetic spacer layer and the adjacent magnetic and ferromagnetic layers.

Wu et al. teach that a close lattice match is desirable because it allows for smooth epitaxial growth and provides a recording medium with a high signal-to-noise ratio (see abstract).

It would have been obvious to adjust the concentrations of the various elements in the spacer layer taught by Carey et al. in order to achieve the optimal lattice parameter for optimal

matching. Such an optimization would have been obvious since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 1-4 and 10 require a lattice mismatch of less than 6%. It is the Examiner's contention that it would have been obvious to optimize this parameter in order to achieve optimal lattice matching and improved magnetic recording properties as a result since lattice matching affects the epitaxial growth and signal-to-noise ratio of a recording medium as disclosed by Wu et al. Such an optimization would have been obvious since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

6. Applicant's arguments filed 9/11/03 have been considered but are not persuasive.

Applicant argues that one of ordinary skill in the art would not have modified Carey et al. in accordance with the teachings of Wu et al. in the manner proposed by the Examiner. Applicant argues that Wu et al. disclose an intermediate layer of a particular material which is used to provide smooth lattice match transition (a material that is not used by Carey et al.).

7. The critical feature of Wu et al. that is relied upon in the rejection set forth above is that it is beneficial to lattice match an intermediate layer and an overlying magnetic layer. One of ordinary skill in the art would have reasonably concluded that this principal of lattice matching would also apply to the structure set forth by Carey et al. That is, it would have been obvious to

provide as close to 100% lattice matching between the layers taught by Carey et al. in view of Wu et al.'s teaching of the benefits of smooth lattice match transitions.

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Thus, the Examiner maintains the position that one of ordinary skill in the art would have been motivated to optimize the lattice matching between the layers disclosed by Carey et al. in view of Wu's teaching of the benefits of optimization of lattice matching between layers.

Applicant further maintains that Carey et al. does not suggest an alloy of Ru with the other spacer layer elements disclosed therein. The Examiner has given the disclosure of a "spacer film...formed of a material selected from the group consisting of ruthenium (Ru), chromium (Cr), rhodium (Rh), iridium (Ir), copper (Cu), and their alloys" the broadest reasonable reading. Accordingly, it is the Examiner's contention that this statement would immediately suggest to one of ordinary skill in the art that alloys of Ru with one or more of Cr, Rh, Ir and Cu is within the scope of the invention in addition to the broader group of Ru alloys.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (703) 305-2642. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Holly Rickman
Primary Examiner
Art Unit 1773

hcr
December 9, 2003